

I would, however, point out that it is impracticable by means of measuring any single photograph to determine the error introduced through the irregularities on the Moon's limb; so that the evidence adduced by Prof. Pritchard fails to affect the justice of my criticism.

If these irregularities were of the nature of pointed peaks at intervals projecting in the sky, then Prof. Pritchard would be correct. But, in truth, they are great elevations extending along the limb for hundreds of miles at a time, so that it is indifferent from what point you measure: in every case you have a systematic error.

It is this systematic error which is so dangerous; the mere presence of peaks at intervals would give rise to errors which would disappear in the mean.

On some Changes in the Markings of Mars, since the Opposition of 1877. By N. E. Green, Esq.

The details of *Mars* were carefully scrutinised during the past Opposition, in order to identify as far as possible the forms observed at Madeira in 1877, and to detect any changes that might have occurred since that date.

The atmosphere of St. John's Wood has not been favourable, few evenings afforded good views, and even on favourable occasions, either the atmosphere of *Mars* or its brilliant reflection made definition especially trying to the eye. The best views were obtained on nights when *Saturn* was almost put out by fog, which, reducing the glare of *Mars*, served only to make its features more distinctly visible.

However, several drawings were made, the details of which confirm by far the greatest part of the map appended to the drawings of *Mars* in the Memoirs. The various markings have been identified point by point. Indeed, with the exception of a few minute forms, the whole has been re-observed, and where the London air has failed, Professor Niesten at Brussels, Mr. Burton near Dublin, and Mr. Denning at Southampton, have succeeded in drawing just those parts which required confirmation.

Professor Niesten has forwarded a very valuable series of 16 drawings made during the last Opposition, and Mr. Burton has been particularly fortunate in securing some very exact views of the neighbourhood of Terby Sea.

The intention of this Note is to point out a few changes in the surface markings, some of which have special interest, when the drawings of 1879 are compared with those of previous Oppositions. One of these changes is the appearance during November and December 1879 of a band of light in latitude 20° S. extending from longitude 260° to 360° , uniting in one long line of light Dreyer, Hirst and Phillips Islands. To the east of

Phillips Island this band of light turned towards the equator, and, passing between Dawes Forked Bay and Burton Bay, formed a connection with Beer Continent. The interest connected with this appearance is that it repeats what was seen by Beer and Mädler in 1830, by Lockyer in 1862, and Kaiten in 1864, whereas at Madeira in 1877 this portion of the planet's surface was more or less filled with half tint, on which the islands were but indistinctly seen. This was especially the case with Phillips Island, and the space between Dawes' Forked Bay and Burton Bay always appeared dark enough to continue the equatorial band as an unbroken effect of shade.

Near Noble Cape, during the last and some previous oppositions, a line of light has been occasionally seen, connecting this form with Webb Land; but here also there was the most definite filling up of half tint during the observations made at Madeira.

These temporary observations of the darker portions of the surface are amongst the most frequent phenomena of the planet, and will account for many discrepancies in the drawings of different observers.

One of the most remarkable instances of obscuration and reappearance is that of the dark mark to the north of Terby Sea known in Mr. Proctor's map as Dawes Sea. This form was drawn by Dawes, Lockyer and Kaiten, but in the Opposition of 1877 was certainly invisible. A most careful and persevering search was made for it at Madeira, with all powers, and on the best occasions, and, with the exception of a faint elongated streak of shade, nothing could be seen. This mark has returned in all its previous definite character during the Opposition just past.

With regard to the dark canals so sharply depicted by Professor Schiaparelli, both Mr. Burton and myself have seen traces of them, and in one instance there is very fair agreement in position, but it is hardly safe to regard them as belonging to the permanent markings, for if all the dark lines which have been seen by observers were filled in on a single map the greatest confusion would ensue.

It is possible that some of these lines may be the boundaries of faint tones of shade, so delicate that they escape the notice of any but a well-trained eye, or they may be spaces between veil-like masses of atmosphere; in either case their position would be variable.

These observations would lead us to regard the larger dark marks as the most permanent features of the planet, but subject to partial obliteration, or even long-continued disappearance, from the imposition of some lighter cloud-like material.